UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,684	12/14/2001	Rohit Garg	UNIV0122	1347

25268 7590 05/03/2004

LAW OFFICES OF RONALD M ANDERSON
600 108TH AVE, NE
SUITE 507
BELLEVUE, WA 98004

EXAMINER	
CHEN, PO WEI	

ART UNIT	PAPER NUMBER
2676	5

DATE MAILED: 05/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,684	GARG ET AL.	
	Examiner	Art Unit	
	Po-Wei (Dennis) Chen	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-20* is/are allowed.

6)☒ Claim(s) *21-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

In response to an Amendment received on February 23, 2004. This action is final.

Claims 1-36 are pending in this application. Claims 1, 16, 21 and 28 are independent claims.

The present title of the invention is "Macroblock padding".

The Group Art Unit of the Examiner case is now 2676. Please use the proper Art Unit number to help us serve you better.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 21-25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) in view of Chen et al. (US 6,625,212; refer to as Chen herein) and Parikh et al. (US 6,421,058; refer to as Parikh herein).

3. Regarding claim 21, Itokawa discloses an image processing comprising:

A method for padding a macroblock of a video object (lines 48-49 of column 13 and Fig. 11);

(a) determining a graphics primitive with a host processor based on shape data representing the video object that are accessible by the host processor (lines 28-32 of column 13 and Fig. 11; the image object extracted based on the shape data corresponds to the graphics primitive. While claim recites host processor, the term is broad enough to include object extraction unit which is used to process shape data);

(b) communicating the graphics primitive to a coprocessor (lines 37-43 of column 13 and Fig. 11; while claim recites coprocessor, the term is broad enough to include the padding block generating unit which processing the padding operation that depend on shape data);

and (c) padding the macroblock with the coprocessor, based on the graphics primitive and on texture data that are accessible by the coprocessor (lines 37-63 of column 13 and Fig. 11; it is noted that the padding by the padding block generating unit (coprocessor) utilize shape data and texture data).

Itokawa does not disclose shape data being stored in a host memory that is accessible by the host processor. Chen discloses a pixel padding procedure utilizing the method (lines 18-65 of column 2 and lines 46-55 of column 6 and Fig. 7; it is noted that memory stores the video object which contains shape data and texture data (pixel data). And the memory is accessible by the processor (CPU)). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide a memory which would also stores object data for the system to easy and quick access to the data. Both Itokawa and Chen are directed to a method of macroblocks padding.

The combination of Itokawa does not disclose a data bus that couples the host processor in communication with the coprocessor. Parikh discloses a graphics command stream calling a display object in a graphics system utilizing the system (lines 10-60 of column 7 and Fig. 2-5). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Parikh to provide a high performance graphics system allowing geometry to be rendered with many attributes (lines 25-32 of column 3, Parikh). Also, it is very well known in the art to utilize bus to transfer data between processing units such as CPU and microprocessors.

4. Regarding claim 22, Itokawa discloses an image processing comprising:

The shape data indicates: (a) any transparent pixels in the macroblock; and (b) any opaque pixels in the macroblock (lines 9-21 of column 14 and Fig. 12; while claim recites transparent and opaque pixels, it is noted the applicant disclosed they are referred to as pixels lie outside and inside, respectively, the boundary of the video object (lines 7-9 of page 3 and line 17 of page 7). It is noted that Itokawa disclosed the later terms).

5. Regarding claim 23, Itokawa discloses an image processing comprising:

(a) determining a number of one or more transparent pixels to be padded from the shape data and (c) determining coordinates of at least one opaque pixel having texture data that will be used for padding said one or more transparent pixels (lines 9-38 of column 14 and Fig. 12; while claim recites transparent and opaque pixels, it is noted the applicant disclosed they are referred to as pixels lie outside and inside, respectively, the boundary of the video object (lines 7-9 of page 3 and line 17 of page 7). And each pixel of each macroblock is being determined if it is outside of the object and set as padding target or inside of the object and set as texture data which is then used for padding if it qualifies as one);

(d) selecting a primitive that encompasses the one or more transparent pixels that were determined (lines 9-13 and 39-44 of column 14 and Fig. 12; the macroblocks that were set as padding target data (including pixels lie outside of the object, or transparent pixels) correspond to the primitive);

and (e) communicating the primitive, at least one transparent pixel, and at least one opaque pixel to the coprocessor (lines 2-47 of column 14 and Fig. 11 and 12; it is noted that the

process of determining the transparent and opaque pixel and primitive (padding target data) are being utilize by the padding block unit which corresponds to coprocessor).

Itokawa does not disclose determining coordinates of at least one transparent pixel included in the one or more transparent pixels. Chen discloses a pixel padding procedure utilizing the method (lines 6-25 of column 3 and Table 1; it is noted that each non-object pixel (transparent) or object pixel (opaque) is being located using coordinates). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide a more precise location of the pixel using coordinates in Itokawa. Both Itokawa and Chen are directed to a method of macroblocks padding.

6. Regarding claim 24, Itokawa discloses an image processing comprising:

(a) obtaining texture data corresponding to the at least one opaque pixel (lines 46-62 of column 11 and lines 30-38 of column 14 and Fig. 12 and 23; it is noted that the texture data of opaque pixel (outside of object) is being obtain for padding process);

(b) determining a padding texture value for each of the one or more transparent pixels from the texture data corresponding to the at least one opaque pixel (lines 30-38 of column 14 and Fig. 12; it is noted that the texture data of the valid opaque pixel is being used for padding the target transparent pixel); and

(c) rendering the selected primitive to pad each of said one or more transparent pixels of the macroblock (lines 44-50 of column 11 and Fig. 23).

Itokawa does not disclose coordinates of transparent pixel or opaque pixel. Chen discloses a pixel padding procedure utilizing the method (lines 6-25 of column 3 and Table 1; it is noted that each non-object pixel (transparent) or object pixel (opaque) is being located using

coordinates). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide a more precise location of the pixel using coordinates in Itokawa. Both Itokawa and Chen are directed to a method of macroblocks padding.

7. Regarding claim 25, Itokawa discloses an image processing comprising:

The step of padding the macroblock accelerates Motion Picture Experts Group level 4 (MPEG-4) video decoding (lines 12-27 of column 2 and lines 59-64 of column 7; by improving coding efficiency of padding thus accelerates MPEG-4 processing).

8. Regarding claim 27, statements presented above, with respect to claim 21 are incorporated herein. Also see lines 57-67 of column 16 of Itokawa.

9. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644), Chen et al. (US 6,625,212; refer to as Chen herein) and Parikh et al. (US 6,421,058; refer to as Parikh herein) as applied to claim 21 above, and further in view of Gallery et al. (US 6,034,690; refer to as Gallery).

10. Regarding claim 26, the combination of Itokawa, Chen and Parikh does not disclose performing MPEG-2 video decoding. Gallery disclose an image processing utilizing the method (lines 10-14 of abstract and lines 34-38 of column 3). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Gallery to provide the capability of processing MPEG-2 data with higher speed (lines 60-61 of column 1, Gallery). Also, both Itokawa and Gallery are both directed to macroblock processing in MPEG format.

11. Claims 28-29 and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) and further in view of Chen et al. (US 6,625,212; refer to as Chen herein).

12. Regarding claim 28, Itokawa discloses an image processing comprising:

A system for padding a macroblock of a video object, comprising:

(a) a host processor (element 1202 of Fig. 11; while claim recites host processor, the term is broad enough to include any processing unit that is used in a computer environment such as an object extraction unit);

(b) a host memory in communication with the host processor, said host memory storing: machine instructions that cause the host processor to determining a graphics primitive and at least one argument for the graphics primitive based on the shape data (lines 9-13 of column 14 and lines 57-67 of column 16 and Fig. 11-12; it is noted that a storage medium (memory) is used by the processing units such as Fig. 11 to store code to implement various functions of the system such as Fig. 12);

(c) a coprocessor in communication with the host processor to receive the graphics primitive and the at least one argument (lines 37-58 of column 13 and Fig. 11; while claim recites coprocessor, the term is broad enough to include any processing unit that is used in a computer environment such as a padding block unit which receives the macroblocks for padding (primitive) and chroma data (argument));

and (d) a graphics memory in communication with the coprocessor, said graphics memor storing: machine instructions that cause the coprocessor to pad the macroblock based on the graphics primitive, the at least one argument, and the texture data (lines 9-13 of column 14 and

lines 57-67 of column 16 and Fig. 11-12; it is noted that a storage medium (memory) is used by the processing units such as Fig. 11 to store code to implement various functions of the system such as Fig. 12).

Itokawa does not disclose the memory stores shape data and texture data defining a texture for the video object. Chen discloses a pixel padding procedure utilizing the method (lines 18-65 of column 2 and lines 52-55 of column 6 and Fig. 7; it is noted that memory stores the video object which contains shape data and texture data (pixel data)). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide a memory which would also stores object data for the system to easy and quick access to the data. Both Itokawa and Chen are directed to a method of macroblocks padding.

13. Regarding claim 29, Itokawa discloses an image processing comprising:

In communication with the host processor and the coprocessor, said carrying the graphics primitive and the at least one argument from the host processor to the coprocessor (lines 28-43 of column 13 and Fig. 11; the macroblock (primitive) to be padding processed is being sent to padding block unit (coprocessor) from object extraction unit (host processor))

Itokawa does not disclose data bus. Chen discloses a pixel padding procedure utilizing the method (lines 51-52 column 6 and Fig. 7). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide the function of quickly transferring data between different processing units in a system. Both Itokawa and Chen are directed to a method of macroblocks padding.

14. Regarding claim 32-35, statements presented above, with respect to claim 22-25 are incorporated herein. Also see lines 57-67 of column 16 of Itokawa.

15. Claim 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) and Chen et al. (US 6,625,212; refer to as Chen herein) as applied to claim 28 above, and further in view of Kenyon et al. (US 6,577,769; refer to as Kenyon herein).

16. Regarding claim 30, the combination of Itokawa and Chen does not disclose the data bus is one of an accelerated graphics port (AGP) bus and a peripheral component interconnect (PCI) bus. Kenyon disclose a method of data compression utilizing the data bus (lines 8-12 of column 10). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Kenyon to provide the type of data bus for quickly transferring data between different processing units in a system.

17. Claim 31 rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) and Chen et al. (US 6,625,212; refer to as Chen herein) as applied to claim 28 above, and further in view of Butter et al. (US 5,768,537; refer to as Butter herein).

18. Regarding claim 31, Itokawa discloses an image processing comprising:

In communication with the host processor and with the coprocessor, the graphics primitive determined by the host processor until a predefined latency period is surpassed, after which the graphics primitive is communicated to the coprocessor (lines 9-47 of column 14 and Fig. 11-12; it is noted that the all macroblocks of image object are being processed first to determine padding target macroblock by object extraction unit (host processor), then they are processed by padding unit (coprocessor). The predefined latency period correspond to the period of all macroblocks have been processed to determine padding target data). The combination of Itokawa and Chen does not disclose buffer to temporarily store data. Butter disclose a digital video encoder utilizing a buffer (lines 64-66 of column 4). It would have been obvious to one of

ordinary skill in the art to utilize the teaching of Butter to provide a buffer to temporarily store data until it is used to provide better control of the processing order of the data.

19. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) and Chen et al. (US 6,625,212; refer to as Chen herein) as applied to claim 28 above, and further in view of Gallery et al. (US 6,034,690; refer to as Gallery)

20. Regarding claim 36, statements presented above, with respect to claim 26 are incorporated herein. Also see lines 57-67 of column 16 of Itokawa.

Allowable Subject Matter

21. Claim1-20 allowed.

22. The following is a statement of reasons for the indication of allowable subject matter:

Prior art references do not anticipate or suggest the limitation "determining a horizontal primitive with the host processor, as a function of a number of successive transparent pixels detected in the row" and "for each row that includes only transparent pixels, determining a vertical primitive as a function of a number adjacent rows that include only transparent pixels" in combination with the other claim limitations in claim 1 and 16.

Response to Arguments

23. Applicant's arguments with respect to claim 21 have been considered but are moot in view of the new ground(s) of rejection.

24. Applicant's arguments filed February 23, 2004 with respect to claim 28 have been fully considered but they are not persuasive.

Regarding claim 21, the Applicant argues reference Itokawa does not teach that shape

data being stored in a host memory that is accessible by the host processor. This is known in the art taught by Chen (lines 18-65 of column 2 and lines 46-55 of column 6 and Fig. 7; it is noted that memory stores the video object which contains shape data and texture data (pixel data). And the memory is accessible by the processor (CPU)). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide a memory which would also stores object data for the system to easy and quick access to the data. Both Itokawa and Chen are directed to a method of macroblocks padding. It is also well known in the art to store data in a memory to be accessed by processor.

The Applicant further argues Itokawa does not utilize texture data as recited in claim 21. However, since the claim recites padding based on texture data, the term is broad enough to include the padding based on color data which corresponds to texture data, as disclosed by Itokawa (lines 37-63 of column 13).

The Applicant further argues Itokawa does not teach graphics primitive. However, the term is broad enough to include graphic object being extracted and being padded by the color data which corresponds to texture data, as disclosed by Itokawa (lines 37-63 of column 13).

The Applicant argues Itokawa does not teach accelerates MPEG-4 decoding in regards to claim 25. However, since the claim does not recites other limitation on accelerating MPEG-4 decoding, the term is broad enough to include the improved coding efficiency of padding disclosed by Itokawa (lines 12-27 of column 2 and lines 59-64 of column 7).

The Applicant argues reference Chen does not disclose shape data being stored in memory in regards to claim 28. However, this is known in the art taught by Chen (lines 18-65 of column 2 and lines 46-55 of column 6 and Fig. 7). It is noted that memory stores the video

object which is accessible by processor (CPU) to display on monitor (Fig. 7). Thus, it is clear that the memory contains object data such as shape data and texture data (lines 18-65 of column 2), since Chen discloses that the device is setup to implement the processing method, which is using shape data and pixel data for padding process). Also, it is very well known in the art to store shape data and pixel data in a memory for further processing or display.

The Applicant argues reference Itokawa does not disclose latency period in regards to claim 31. However, since the claim does not recites any other limitation on latency period, the term is broad enough to include the period where all macroblocks have been processed to determine padding target data disclosed by Itokawa (lines 9-47 of column 14 and Fig. 11-12).

Conclusion

25. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Po-Wei (Dennis) Chen whose telephone number is (703) 305-8365. The examiner can normally be reached on Monday-Thursday from 8:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C Bella can be reached on (703) 308-6829. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Po-Wei (Dennis) Chen
Examiner
Art Unit 2676

Po-Wei (Dennis) Chen
April 21, 2004

Matthew C. Bella

MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600